State of Iowa - Return on Investment Program / IT Project Evaluation

SECTION 1: PROPOSAL

Project Name: <u>Storage Area Network</u>   Date: <u>9-15-00</u>

Agency Point of Contact for Project: <u>Doug Kern</u>

Agency Point of Contact Phone Number / E-mail: <u>281-7083, doug.kern@its.state.ia.us</u>

Executive Sponsor (Agency Director or Designee) Signature: __Richard Varn, CIO_____

Is this project necessary for compliance with a Federal standard, initiative, or statute? (If "Yes," cite specific requirement, attach copy of requirement, and explain in Proposal Summary)	❑ Yes	**x** No
Is this project required by State statute? (If "Yes," explain in Proposal Summary)	❑ Yes	**x** No
Does this project meet a health, safety or security requirement? (If "Yes," explain in Proposal Summary)	❑ Yes	**x** No
Is this project necessary for compliance with an enterprise technology standard? (If "Yes," explain in Proposal Summary)	❑ Yes	**x** No
Does this project contribute to meeting a strategic goal of government? (If "Yes," explain in Proposal Summary)	**x** Yes	No
Is this a "research and development" project? (If "Yes," explain in Proposal Summary)	❑ Yes	**x** No

PROPOSAL SUMMARY:

In written detail, explain why the project is being undertaken and the results that are expected. This includes, but is not limited to, the following:

Why:
This project is being undertaken to incorporate new technologies to better store, manage, protect and recover the volumes of various data and information collected and distributed in state government. Although technology projects often focus on utilizing computers to process data, networks to deliver data, and applications to determine what to do with data, the actual storage, availability, and protection of the data is frequently in the background of major technology systems, with no less importance, but with less glitz.

Just like with many hardware and software components, electronic storage technology is evolving in a manner that makes it more reliable, more robust, and more efficient. In fact, it must be if it is to deliver on-demand services of data, graphic, image, video, and audio formats through high-speed networks.

This technology will enable ITD, other state agencies, and hopefully other governmental bodies within Iowa to provide electronic services in a manner that is more cost-effective, more feature-rich, and more reliable than older methodologies.   Storage Area Networking will complement the emergence of other technologies and applications targeted for electronic service delivery to those who utilize our services.

1. A pre-project (before implementation) and a post-project (after implementation) description of the system or process that will be impacted.

Pre-Project Description.

This project will implement an emerging technology that will address the requirements for the storage and management of electronic data, including customer/citizen data, text, audio, video, and educational objects.   The current status of electronic storage infrastructure in ITD, as well as across the state enterprise, is based on a model that has been in place for the past 3 decades. This model attaches storage drives directly to servers and processors in a dedicated fashion that cannot be shared by other systems. Although this has functioned in the past, it typically required purchasing a new server whenever increased storage capacity was required. Furthermore, the added capacity might be only utilized by 10% or 20% increments, thus leaving significant amounts of storage unused for extended periods of time. Backup and recovery activities require the use of the server/processor, meaning the computer systems are basically unavailable during backup routines. This discourages optimum backup processes. In addition, many systems across the enterprise use backup schemes that do not utilize storage systems physically distributed from the server site. This is not a "best practice" with regard to isolating backup data from a possible point of incident at the production/operational site.

The growth of data is escalating as new initiatives require collecting more data, publishing more information in an electronic format, and enhancing communications with more e-mail and educational programs. Managing the storage media and the associated data becomes more challenging as the data proliferates and the number of systems and applications grows. Current practices and software tools are lagging the abilities needed to perform state-of-the art storage management activities.

In summary, the pre-project state of electronic storage management is based on a decades old model that is in need of the next-generation architecture to keep pace with the changing landscape of stored data anywhere, any time service levels.

Post-Project Description.

Implementing a Storage Area Network (SAN) within ITD and extended to the state agencies across the capitol complex, as well as to field offices, will provide a standardized infrastructure for electronic storage, including facilities for storing backup copies of data that can be retrieved in an event of data loss or even disaster at the original production site.

Sans are networking platforms that use high-speed connectivity to interconnect independent storage systems with servers. Why would you want to build a SAN? Our move from an industrialized economy to the new world of information brings with it gobs and gobs of data.

Upon implementation of the SAN, procurement and allocation of storage infrastructure will be centralized in a manner that will provide efficiencies of costs and storage allocation. Multiple servers/systems will have access to a pool of non-dedicated storage resources. Storage devices can run at more optimal capacities and new storage procurement can be delayed until capacity limitations are reached across the population of SAN-attached servers. This is in contrast to buying individual storage devices for individual servers/systems on an ad hoc basis.

As the SAN will have a dedicated network, movement of data for cross platform usage and backup purposes will not negatively impact the performance of transport networks that serve users, citizens, and educators via Local and Wide area networks. This dedicated SAN network will also relieve servers of the CPU cycles that currently are consumed to perform snapshot and backup activities.

Management of Storage will be conducted by a dedicated software/appliance component that will organize data, serve as a data traffic cop, and supervise storage backups and de-fragmentation activities. Storage management will become more of a specialty with staff trained as storage analysts and specialists. The amount of storage that an individual can manage will increase significantly from previous levels. This will result in more productive use of staff and will ultimately save on the number of FTE's required to manage storage across the enterprise.

Improved backup/recovery capabilities will be delivered by the SAN. A more formal and robust backup system will provide better protection of the state's data, with a much lesser risk of data backups being forgotten, improperly performed, or improperly stored.

With SAN technology, the effective storage, delivery, and protection of data will do justice to the true value of that data, information, and content. While technology in the past has focused on processing and transport, servers and PC's, applications and the internet, the SAN will bring the importance and mission-criticality of the data into a deserved stature. After all, without the data, the mass of computers and networks is simply infrastructure.

In summary, Storage will be managed more efficiently, resulting in reduced unused capacity. Storage will be managed from a robust perspective of formal policies, procedures, effectiveness measures. Fewer IT staff will be required to handle storage management duties across the enterprise. Offloading storage-centric activities from servers and end-user production networks will save those resources from storage overhead functions, thereby generating improved effectiveness and capacity utilization for those systems, resulting in higher performance and longer life spans between upgrade cycles.

2. A summary of the extent to which the project provides tangible and intangible benefits to either Iowa citizens or to State government. Included would be such items as qualifying for additional matching funds, improving the quality of life, reducing the government hassle factor, providing enhanced services, improving work processes, complying with enterprise technology standards, meeting a strategic goal, avoiding the loss of matching funds, avoiding program penalties/sanctions or interest charges, avoiding risks to health/security/safety, complying with federal or state laws, etc.

Benefits.

This project will provide benefits that appear, on the surface, to be solely of a technology nature. However, the positive impact on service delivery performance also has significant value and merit. The SAN will provide a more robust and sophisticated method for managing data storage. This will provide a solution to IT administrators trying to manage IT projects, applications, and systems with fewer staff and expectations of greater customer responsiveness. Improved operational effectiveness and greater economic efficiencies will be attained, contributing to administrative objectives.

This new infrastructure will also provide opportunities for numerous state agencies and will support new government strategic initiatives and goals, including "100% e by 2003" and "21st Century Learning Infrastructure". Not only will it store data and components for these projects, but it will

manage the performance optimization and backup/integrity/preservation features required by these electronic-driven applications. In turn, this will contribute to enhanced customer/citizen services in support of ITD and Agency projects that have been previously justified independently from this project. Scanning the FY01 Pooled Technology List, it is apparent a number of these projects will be candidates to utilize SAN technology. The benefits will provide economical use of funds and more reliable and available information, data, content, and transactional capabilities.

Benefits: An Executive Overview by The Evaluator Group.

The Evaluator Group, a SAN consulting company, spent several days assessing the current situation in our organization. They identified particular architectures and strategies that would be beneficial to ITD and the enterprise as a whole. Their Executive Overview follows.

The installation of a SAN (Storage Area Network) in the State of Iowa Information Technology Department will provide immediate, short-term benefits however more importantly, it will be the foundation for an IT storage infrastructure that can support the entire state well into this century.

The state's IT storage problems are similar to the industry as a whole; our data requirements are growing at over 100% per year, more applications are being brought on-line, commerce has become a major growth application, more data is required to be on-line and these problems are compounding. We are quickly moving to a continuous operations environment (7x24). The state's IT services will soon be required to maintain operations during storage and server migrations, hardware upgrades, and the addition of servers and storage and for all maintenance activities. We must additionally put disaster recovery solutions in place. Our storage administration costs are compounding for a variety of reasons; today there are no consistent Multiplatform tools to administer storage across heterogeneous server platforms. Each server requires unique tools for storage management, monitoring and control. Our backup operations consume server and storage resources and typically, different software is required for different types of devices. Each specific server requires its own backup and restore software. The administration costs associated with our de-centralized servers is estimated at 55% as a percentage of total costs of ownership.

The State of Iowa as well as the IT industry as a whole is experiencing shortages of trained storage administrators. Today, a well-trained storage administrator can manage approximately 500GB of open systems storage and approximately 2TB of mainframe storage. Simple math shows we will run out of administrators at our current growth rate of storage. The largest problem we face today is getting our storage growth and storage administration costs under control.

The solution we are recommending is the installation of a Fibre Channel SAN (Storage Area Network). SANs are a relatively new technology and we have recommended a phased introduction. The initial phase of the SAN will be a storage consolidation for a variety of Intel-based and UNIX servers for the Iowa Information Technology Department. The SAN solution we are recommending will provide for centralized management of the storage and fabric topology and provide a "Pool" of storage for each attached server. This initial SAN implementation will be a campus-wide (10 kilometers) environment however the SAN will have the capability of expanding to statewide distances via SAN/WAN/SAN and SAN/SAN connectivity. In the future, the SAN will have the capability of connecting to other SANs within the Des Moines state campus, to the Department of Transportation located in Ames (66 Kilometers), other statewide departments and be used for the remote copy of data to various geographically dispersed disaster recovery sites.

Our initial investment in the SAN storage consolidation for the Information Technology Department should be recovered within a year. We will recover the investment with improved administration costs (approximately a 400% improvement), the use of common software across our heterogeneous servers (approximately a 200% improvement), and improved storage utilization (approximately a 200% improvement).

However, the long-term benefits of the SAN are overwhelming. In the near-term SANs will provide for complete centralized management and the abstraction of storage. This translates to the ability of attaching "anyone's storage" to "anyone's server". SANS will break the traditional server/storage ownership relationship by providing virtual pools of storage to any attached server. We will have the capability of dynamically adding/retiring storage, sharing files between heterogeneous servers, improved security via serialization of access, and eventually using the fiber channel for the movement of data from our mainframes and open system servers. SANs are driving the cost of storage to commodity pricing. The state will be able to purchase distributed storage from any vendor supporting a fabric. The state will be to move storage devices between departments and install them dynamically on the topology. The greatest benefit will be realized in improved administration. It is estimated that with a virtualized pool of storage, a single administrator will be able to manage tens of terabytes of data.

It is our combined opinions that Fibre Channel SANs are the future for storage. Fibre Channel SANs are the only current technology providing solutions to today's major storage problems. Fibre Channel SAN technology will provide immediate short-term solutions and provide Iowa's IT infrastructure a foundation for real-time information sharing across our entire state.

3. A summary that identifies the project stakeholders and how they are impacted by the project.

The stakeholders are numerous. For those electronic storage managers across the enterprise, the technology provides more powerful software and methods to duplicate and restore data in the event of system failures or corrupted data. For budget purposes, the long term result will be fewer staff needed to support storage management activities and fewer storage devices overall. It will also provide a centralized service that will leverage a single system across several entities, resulting in a more formal management process and consolidate many backup methodologies into a common one. For users of electronic services, this project will provide high access and transactional performance, improved storage availability, in addition to data recovery and restoration if negative events should require it.

SECTION 2: PROJECT PLAN

Individual project plans will vary depending upon the size and complexity of the project. A project plan includes the following information:

1. Agency Information

Project Executive Sponsor Responsibilities: Identify, in Section I, the executive who is the sponsor of the project. The sponsor must have the authority to ensure that adequate resources are available for the entire project, that there is commitment and support for the project, and that the organization will achieve successful project implementation.

The State of Iowa Chief Information Officer is the sponsor of the project. This sponsorship will support the activities of ITD to further implement the Storage Area Networking strategy. ITD is already working on early phases leading toward the successful implementation of SAN technology.

Organization Skills: Identify the skills that are necessary for successful project implementation. Identify which of these skills are available within the agency and the source(s) and acquisition plan for the skills that are lacking.

Necessary skills include:
- Project management
- Customer relationship building (with other state agencies)
- Vendor relationships
- SAN architecture and product knowledge
- Storage management competence
- Software configuration skills
- Network connection and management skills
- Security awareness

Most of these skills either currently exist or will exist within the department. Staff training will complement current skills to enable successful implementation and support of this project. Selected product vendors will provide expertise with product selection, system design, and component configuration. Over time, experience developed in-house will lead to a more self-sufficient approach to project roll-out.

2. Project Information

Mission, Goals, Objectives: The project plan should clearly demonstrate that the project has developed from an idea to a detailed plan of action. The project plan must link the project to an agency's mission, goals, and objectives and define project objectives and how they will be reached.

ITD is a service provider, to varying degrees, to all the agencies in the state enterprise. Our goal is to provide responsive, secure, and available electronic services that support the objectives of other agencies as well as our own. This often requires current and state of-the-art technologies with the capability and performance of delivering these services in a manner suitable to our customers while at the same time maintaining compatibility with their technology architectures.

This project will enhance services in one particular technical area: Electronic Storage. The concept of storage being a technology specialty of its own, as opposed to being a dedicated subset of a computing system, is now becoming a reality. The idea that storage can be shared by multiple systems, managed by a storage administrator instead of several server technicians, provide backup and recovery processes without negatively impacting server CPU cycles or production network bandwidth capacities has now progressed from a desire to practical solutions and products.

This new technology has been considered fully within the context of ITD systems as well as those computing systems of other state agencies that exist across the capitol complex and remote offices across the state. Opportunities have been identified and considered.   From a pilot project to full ITD deployment, from service to the capitol complex to connectivity to state offices across the state, a methodical, incremental approach will encompass the scope of this project.

These objectives will be achieved in phases, with activities and monetary expenditures occurring over a rational period of time. In addition, the technology is evolving rapidly, so a phased approach will enable us to incorporate newer technologies as each stage is developed thereby minimizing risk of technological obsolescence.

A project manager will be involved continuously with this project to ensure progress and costs are optimized.

A. **Expectations**: A description of the purpose or reason that the effort is being undertaken and the results that are anticipated.

> As more government activities become recorded, processed, and distributed by electronic means, the volume of data, information, and transactions increasingly grow, requiring ever more storage media to house the data and more technical staff attention to managing it effectively.

The challenge is to not only store, manage, and protect the data, but to do so in a cost-efficient manner that makes stored data and devices available to many different systems and users both within the enterprise and extended to those citizens and customers reached outside the governmental organization.

This Storage Area Network addresses these challenges with storage products and management systems.

B. **Measures**: A description of the set of beliefs, tradeoffs and philosophies that govern the results of the project and their attainment. How is the project to be judged or valued? What criteria will be used to determine if the project is successful? What happens if the project fails?

The project will be valued by the amount of storage capacity provided, the number of systems that can reach it, the knowledge of where the data is, the dollar savings achieved by fewer staff to manage data, and the expanded services that will effectively backup data and preserve it in the event of disaster or contamination in its native operational site.

The project will be successful when current fragmented storage units with underused capacity are integrated into a "bunch of disks" that reduce the amount of storage space that goes unused. Storage can be allocated to multiple systems as needed, rather than buying dedicated devices per server or even entire servers just to increase storage capacity as is done today.

Success will also come from the standardized architecture that will be implemented. Interoperability will be enhanced and non-standard or obsolete equipment will not be procured. In effect, a more enterprise-centric approach to this technology will emerge, with investment protection as a bonus.

Should the project prove to be unsuccessful, the phased approach to this implementation will identify loss limitations early on, without expending future resources ineffectively. Operational capabilities will be ensured with vendors prior to installation. If there is installation failure, vendors will be responsible for this, minimizing financial and operational risk for us.

Should actual system usage be less than anticipated, the project would be scaled back or halted. This would have a risk-minimizing effect.

C. **Environment:** Who will provide input (e.g., businesses, other agencies, citizens) into the development of the solution? Are others creating similar or related projects? Are there cooperation opportunities?

A SAN project team was formed very early in the project to gain education and awareness of the technology. Representatives were from multiple agencies, including ITD. ITD management and technical staff representing our storage and systems area were involved. A consultant provided a workshop/training session and a technical staff member attended a Storage Area Networking conference.

Vendors provided information sessions regarding their products and services and a view of the state of the SAN industry.

ITD views this as an opportunity to implement SAN technology within the department as we provide services to state agencies, as well as citizen-reaching applications like 21st Century Learning and Solaces. Other agencies will have an opportunity to partner with us to utilize this service for the benefit of their systems and users. They will have the ability to procure from our contracts.

D. **Project Management and Risk Mitigation**: A description of how you plan to manage the project budget, project scope, vendors, contracts and business process change (if applicable). Describe how you plan to mitigate project risk.

An internal project manager, in conjunction with ITD administrative staff, will perform project management activities. When other agencies are involved, an agency representative will hold the role of project contact.

MS-Project tracking software will be utilized. Vendors will be required to appoint a project manager and provide progress reports on a bi-weekly basis at a minimum.

An RFP will be utilized to determine specific products and vendors involved in the project. Pricing and performance will be monitored against contract terms and conditions.

Project scope will be well-defined prior to implementation and any modifications will be handled via a change management process with authorized sign-off criteria.

Risk will be managed by requiring that configurations and implementations are held to scope requirements, result in operational outcomes, and meet contract pricing terms.

E. **Security / Data Integrity / Data Accuracy / Information Privacy**: A description of the security requirements of the project? How will these requirements be integrated into the project and tested. What measures will be taken to insure data integrity, data accuracy and information privacy?

Security in the storage environment consists of many elements. Access to data is governed by user passwords, file access codes, secured networks, and secure operational facilities. SAN products include security conditions that are governed by the SAN administration technical personnel. Policies and procedures for allocating storage devices and capacities to various computing systems will include security as a criteria.

Any SAN management customization will include security configuration details. System testing will be conducted prior to production roll-out.

The project team will include ITD's Chief Security Officer.

3. Current Technology Environment (Describe the following):

A. **Software (Client Side / Server Side / Midrange / Mainframe)**

- Application software
- Operating system software
- Interfaces to other systems: Identify important or major interfaces to internal and external systems

SAN technologies consist of a management system that can facilitate the interoperability of various server/mainframe operating systems with various storage products (disk, tape) from heterogeneous vendors.

B. **Hardware (Client Side / Server Side / Mid-range / Mainframe):**

- Platform, operating system, storage and physical environmental requirements.
- Connectivity and Bandwidth: If applicable, describe logical and physical connectivity.
- Interfaces to other systems: Identify important or major interfaces to internal and external systems.

SAN systems strive for system independence. That is one of its major advantages.

4. Proposed Environment (Describe the following):

A. Software (Client Side / Server side / Mid-range / Mainframe)

- Application software.
- Operating system software.
- Interfaces to other systems: Identify important or major interfaces to internal and external systems.
- General parameters if specific parameters are unknown or to be determined.

SAN is an independent system providing interoperability.

B. Hardware (Client Side / Server Side / Mid-range / Mainframe)

- Platform, operating system, storage and physical environmental requirements.
- Connectivity and Bandwidth: If applicable, describe logical and physical connectivity.
- Interfaces to other systems: Identify important or major interfaces to internal and external systems.
- General parameters if specific parameters are unknown or to be determined.

SAN is an independent system providing interoperability.

Data Elements: If the project creates a new database the project plan should include the specific software involved and a general description of the data elements.

N/A

Project Schedule: A schedule that includes: time lines, resources, tasks, checkpoints, deliverables and responsible parties.

June 1, 2001 -	Identify points of expansion for SAN.
July 1, 2001 -	Work with SAN component vendor to determine equipment needs.
July 1, 2001 -	Begin installation of campus network cable for SAN infrastructure.
August 1, 2001-	Begin installation of SAN components.
Sept. 1, 2001 thru June 30, 2002-	Continue build out of campus SAN. Test and verify each step
June 30, 2002	Completed campus installation-phase1

SECTION 3: Return On Investment (ROI) Financial Analysis

Project Budget:

Provide the estimated project cost by expense category.

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Personnel ................................ $____80,000____
Software ................................. $____75,000____
Hardware ................................ $__1,645,000____
Training ................................. $_____
Facilities ................................ $_____
Professional Services ............. $___200,000____
Supplies ................................ $_____
Other (Specify)….….……… $_____
              Total ................. $__2,000,000___
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Project Funding:

Provide the estimated project cost by funding source.

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State Funds ............................ $__2,000,000___ .........___100___ % of total cost
Federal Funds ........................ $_____ ........._____ % of total cost
Local Gov. Funds ................... $_____ ........._____ % of total cost
Private Funds ........................ $_____ ........._____ % of total cost
Other Funds (Specify) ............ $_____ ........._____ % of total cost
              Total Cost: .............. $_____ ........._____ % of total cost
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Provide the estimated project cost by fiscal year.

How much of the cost would be incurred by your agency
from normal operating budgets (staff, equipment, etc.)?   .... ……$___0_____   _0___%

How much of the cost would be paid by requested State IT project funds? $_2,000,000   _100_%

Identify, list, and quantify all annual maintenance expenses (State Share) related to the project.

FY 2003 and onward.

> Project, next phase: $ 2,000,000

Identify, list, and quantify any other future expenses (State Share) related to the project.

Future expenses would be for subsequent phases beyond the scope of

this project phase.

ROI Financial Worksheet Directions (Attach Written Detail as Requested):

Annual Pre-Project Cost -- Quantify, in written detail, all actual State government direct and indirect costs (personnel, support, equipment, etc.) associated with the activity, system or process prior to project implementation. This section should be completed only if State government costs are expected to be reduced as a result of project implementation.

Response:

 Not applicable.

Annual Post-Project Cost -- Quantify, in written detail, all estimated State government direct and indirect costs associated with activity, system or process after project implementation. This section should be completed only if State government costs are expected to be reduced as a result of project implementation.

Response:

 Not applicable.

State Government Benefit -- Subtract the total "Annual Post-Project Cost" from the total "Annual Pre-Project Cost." This section should be completed only if State government costs are expected to be reduced as a result of project implementation.

Response:

 Not applicable.

Citizen Benefit -- Quantify, in written detail, the estimated annual value of the project to Iowa citizens. This includes the "hard cost" value of avoiding expenses (hidden taxes) related to conducting business with State government. These expenses may be of a personal or business nature. They could be related to transportation, the time expended on or waiting for the manual processing of governmental paperwork such as licenses or applications, taking time off work, mailing, or other similar expenses.

Response:

 Not applicable.

Opportunity Value/Risk or Loss Avoidance Benefit -- Quantify, in written detail, the estimated annual benefit to Iowa citizens or to State government. This could include such items as qualifying for additional matching funds, avoiding the loss of matching funds, avoiding program penalties/sanctions or interest charges, avoiding risks to health/security/safety, avoiding the consequences of not complying with State or federal laws, providing enhanced services, avoiding the consequences of not complying with enterprise technology standards, etc.

Response:

 This project will provide reliable storage of electronic data as well as improved
 backup copies of this data. State government departments store and keep
 millions of elements of information in an electronic format. This information
 is vital to the operation of state government, its citizens, its clients, and the
 enterprises within Iowa. This data includes records relating to taxes,
 benefit recipients, licensing programs, just as a small example. It would
 be extremely difficult to quantify the value of the data that will be stored
 in the system represented in this ROI document. It would not be difficult
 to imagine the risk of loss of data regarding a welfare benefit, a tax
 refund, a medical license. If the data would be lost, could it be

recovered in a similar form? If the data would disappear, how possible and costly and timely could it be recreated from some original document? This project will take a significant step to ensure the ongoing value of current and future data stored in an electronic form, as well as protecting from the risk of permanent loss of this data.

There is an opportunity to deliver more reliable service to citizens and to enhance the ability to replicate data so it can be safely stored in the event the data ever needs to be retrieved should loss of original data sources occur.

There is an opportunity to generate dollar savings when future expenditures are made for electronic storage purposes. It is estimated that over a three year period, **savings over $500,000 per year** can be realized. Benefits in years beyond that can continue.

Total Annual Project Benefit -- Add the values of all annual benefit categories.

Response:

Benefit comparisons are made by comparing the project development "without" utilizing SAN technology (W/O SAN) versus "with" utilizing SAN technology (W/SAN).

Realized Benefits in Annualized format:	W/O SAN	W/SAN
Direct SAN investment savings:		
$677,000 vs. $672,000		$5,000
Cost Avoidance in Annualized format:	W/O SAN	W/SAN
Non-SAN budgeted expenditures (server savings):		
$710,000 / 3		$236,000
Cost Avoidance in Annualized format:	W/O SAN	W/SAN
FTE Cost Avoidance: Year 2 & Year 3:		
$1,060,00 / 3		$353,000

Total Annual Project Benefits	**=**	**$594,000**

Total Annual Project Cost -- Quantify, in written detail, the estimated annual new cost necessary to implement and maintain the project including consulting fees, equipment retirement, ongoing expenses (i.e. labor, etc.), other technology (hardware, software and development), and any other specifically identifiable project related expense. In general, to calculate the annual hardware cost, divide the hardware and associated costs by three (3), the useful life. In general, to calculate the annual software cost, divide the software and associated costs by four (4), the useful life. This may require assigning consulting fees to hardware cost or to software cost. A different useful life may be used if it can be documented.

Response:

Install Storage Area Networking technology, including connectivity from Hoover Building to 4 buildings on the capitol campus, storage devices for operational purposes, storage for backup/recovery requirements, software to manage storage devices, and staff to administer storage infrastructure. This cost comparison is based on what will be done without SAN technology versus what will be done with SAN technology. Electronic data storage expenditures will occur in either environment. It is a matter of choosing the best technology solution in addition to a cost effective one.

This analysis compares the cost of expenditures during FY02 utilizing legacy based technology verses utilizing SAN technology. Investments in SAN architectures will decrease expenditures in some areas of legacy designs and implementations.

Expenditure-SAN related	W/O SAN	W/SAN
Network to 4 buildings	$ 0	$400,000
Storage: Operational		
3.4 TeraBytes	$476,000	$595,000
Storage : Backup		
Mainframe	$350,000	$350,000
License fees(servers)	$360,000	$100,000
Mirroring capability	N/A	$200,000
Software – SAN	$ 0	$ 75,000
Consulting/design	$150,000	$200,000
Added Maintenance	$ 6,000	$ 0
Staff: support FTE's		
Year 1	3= $ 240,000	1 = $ 80,000
Total Year 1 Expenditure	$ 1,582,000	$ 2,000,000
Expenditures: Difference		$418,000

FTE Expenditures Year 2 & Year 3:	W/O SAN	W/SAN
Year 2	5= $ 425,000	1 = $ 85,000
Year 3	11= $ 990,000	3 = $ 270,000
Total Year 2 + Year 3	$1,415,00	$ 355,000
Difference over 2 years:	+ $1,060,000	
Cost Avoidance-2 Years:		$1,060,000

Expenditures-not SAN budget	W/O SAN	W/SAN
Year 1:		
Server deployment	$750,000	$ 40,000
Difference:	+ $710,000	
Cost Avoidance:		$710,000

Project Costs in Annualized format:		W/O SAN	W/SAN
Network to 4 buildings:			
$300,000 / 3	=		$100,000
$100,000 / 10	=		$ 10,000
Storage: Operational:			
$476,000 / 3	=	$158,000	
$595,000 / 3	=		$198,000
Storage: Backup:			
$710,000 / 3	=	$236,000	
$650,000 / 3	=		$216,000
Software-SAN:			
$75,000 / 4	=		$ 18,000
Consulting / Design:			
$150,000 / 4	=	$ 37,000	
$200,000 / 4	=		$ 50,000
Added Maintenance:	=		
$ 6,000 / 1	=	$ 6,000	
Staff – FTE's – Year 1:			
$240,000 / 1	=	$240,000	
$ 80,000 / 1			$ 80,000
		--------------	------------------
		W/O SAN	**W/SAN**
Total Annualized Project cost: =		**$677,000**	**$672,000**

Benefit / Cost Ratio – Divide the "Total Annual Project Benefit" by the "Total Annual Project Cost." If the resulting figure is greater than one (1.00), then the annual project benefits exceed the annual project cost. If the resulting figure is less than one (1.00), then the annual project benefits are less than the annual project cost.

Response:

Total Annual Project Cost	=	$672,000
Total Annual Project Benefit	=	$594,000
Total Annual WO/SAN Avoidance=		$677,000
Benefit + Avoidance	=	$1,271,000

Benefit / Cost Ratio: $1,271,000/$672,000   =   1.89

ROI -- Subtract the "Total Annual Project Cost" from the "Total Annual Project Benefit" and divide by the amount of the requested State IT project funds.

Response:

Total Annual Project Benefit - Total Annual Project Cost:
    $1,271,000 - $672,000 = $599,000

Total requested IT project funds = $2,000,000

ROI   = $599,000 / $2,000,000 = .30 = 30%

Benefits Not Cost Related or Quantifiable -- List the project benefits and articulate, in written detail, why they (IT innovation, unique system application, utilization of new technology, hidden taxes, improving the quality of life, reducing the government hassle factor, meeting a strategic goal, etc.) are not cost related or quantifiable. Rate the importance of these benefits on a "1 – 10" basis, with "10" being of highest importance. Check the "Benefits Not Cost Related or Quantifiable" box in the applicable row.

Response:

While some of the project characteristics might be quantified to some degree, others may not be so readily calculated. Furthermore, a portion of this project is based on growth of new storage devices, for which there is no pre-project condition, although the assumption is that this growth will occur regardless of other circumstances. Any growth of data storage would be justified by other projects that would utilize this storage. The benefits of this project will be both short term and long term, with the overall benefits extending well into the future.

The purpose of the project is multifold. To incorporate new technology in order to keep abreast with changes in demand for applications and evolutions in system <u>architectures</u>. To provide an enterprise-wide backup system to safely <u>preserve data</u> in the event of mishaps or disasters. To utilize capacity in a more efficient manner by deploying <u>central storage</u> rather than fragments of server-dedicated storage. To develop a more <u>standardized architecture</u> which embraces open standards and interoperability. To maximize the expertise of scarce storage management personnel. To dynamically allocate storage without impacting entire systems, <u>availability</u>, or capability. To improve <u>performance</u> and access to data for government workers as well as the citizenry conducting business with state government by providing improved system "up time". And, not least of all, to gain increased <u>cost efficiencies</u> in the deployment of IT dollars.

   Ratings – importance of benefits:
        Architecture =   7
        Data Preservation = 10
        Centralization =   6
        Standardization =   8
        Availability =   7
        Performance =   6
        Cost effective =   7

ROI Financial Worksheet

Annual Pre-Project Cost - How You Perform The Function(s) Now	
FTE Cost (salary plus benefits):	**N/A**
Support Cost (i.e. office supplies, telephone, pagers, travel, etc.):	**N/A**
Other Cost (expense items other than FTEs & support costs, i.e. indirect costs if applicable, etc.):	**N/A**
A. Total Annual Pre-Project Cost:	**N/A**
Annual Post-Project Cost – How You Propose to Perform the Function(s)	
FTE Cost:	**N/A**
Support Cost (i.e. office supplies, telephone, pagers, travel, etc.):	**N/A**
Other Cost (expense items other than FTEs & support costs, i.e. indirect costs if applicable, etc.):	**N/A**
B. Total Annual Post-Project Cost:	**N/A**
State Government Benefit (= A-B):	**N/A**
Annual Benefit Summary	
State Government Benefit:	-
Citizen Benefit (including quantifiable "hidden taxes"):	-
Opportunity Value and Risk/Loss Avoidance Benefit:	**$1,271,000**
C. Total Annual Project Benefit:	**$1,271,000**
D. Total Annual Project Cost:	**$672,000**
Benefit / Cost Ratio (C / D):	__1.89____
ROI (C – D / Requested State IT Project Funds):	___30___%
X Benefits Not Cost Related or Quantifiable (including non-quantifiable "hidden taxes")	